

REMARKS

Claims 30-41 have been amended. No claims have been added or cancelled. Claims 1-41 are pending in the application. Reconsideration is respectfully requested in light of the following remarks.

Section 102(e) Rejection:

The Examiner rejected claims, 1, 2, 6-12, 14-18, 22-28, 30 and 34-40 under 35 U.S.C. § 102(e) as being anticipated by Yakir et al. (U.S. Publication 2004/0049513) (hereinafter “Yakir”). Applicants respectfully traverse this rejection for at least the reasons presented below.

Regarding claim 1, Yakir does not disclose file system software comprising a multi-class storage mechanism, wherein the multi-class storage mechanism is configured to monitor access of data stored in a multi-class file system comprising a hierarchy of storage classes to generate access information for the data, wherein each storage class comprises one or more storage devices assigned to the storage class according to one or more characteristics of the storage class. Yakir teaches a multi-disk and multi-volume system, but does not disclose a hierarchy of storage classes. Nor does Yakir disclose that each storage class comprises storage devices assigned to the storage class *according to characteristics of the storage class*. The Examiner cites paragraphs [0020], [0070], [0090] and [0092] of Yakir, asserting that Yakir’s “storage units 102 may be organized into one or more logical storage units/devices 104” and that a “logical storage unit may reside on non-continuous physical partitions.” However, Yakir does not mention anything about a multi-class file system including *a hierarchy of storage classes*, where each storage class includes storage devices assigned to the storage class *according to characteristics of the storage class*. Yakir merely discloses multiple storage devices and multiple logical storage units, but fails to mention a hierarchy of storage classes and storage devices assigned to a storage class according to characteristics of the storage class. The fact that Yakir’s system includes multiple storage devices/units does not

disclose the specific limitations of a multi-class file system including *a hierarchy of storage classes* and storage devices assigned to a storage class *according to characteristics of the storage class*.

The Examiner also asserts that each of Yakir's storage units "is generally identifiable by a unique identifier that may be specified by the administrator." However, providing a unique identifier for storage unit does not disclose assigning storage units to storage classes *according to one or more characteristics of the storage class*. The unique identifiers to which the Examiner refers merely allow each storage unit to be uniquely addressed. Yakir does not mention anything about the unique identifiers being characteristics of any storage class. Thus, Yakir fails to disclose wherein each storage class comprises one or more storage devices assigned to the storage class according to one or more characteristics of the storage class.

Further regarding claim 1, Yakir also fails to disclose a multi-class storage mechanism configured to apply the access information to a set of policies for the multi-class file system. The Examiner cites FIG. 1, item 114 and paragraph [0023] of Yakir. However, item 114 of FIG. 1 and paragraph [0023] merely disclose that Yakir system includes "information 114 related to storage policies and rules configured for the storage environment" (Yakir, paragraph [0023]). Yakir does not, however, teach anything regarding applying access information (generated from the monitoring of data stored in a multi-class file system) to a set of policies for the multi-class file system. Yakir does not teach anything regarding applying any access information to the storage policies and rules of information 114. Nor does Yakir describe applying access information to any other set of policies. The mere existence of storage policies does not inherently include or imply applying access information to storage policies. Without some specific disclosure by Yakir regarding applying access information to a set of policies, Yakir cannot be said to anticipate a multi-class storage mechanism configured to apply access information to a set of policies for a multi-class file system.

Additionally, Yakir fails to disclose a multi-class storage mechanism configured to migrate a portion of the data to different storage classes in the hierarchy of storage classes in response to the application of access information to the set of policies for the multi-class file system. The Examiner cites the same portions of Yakir (FIG. 1, item 114 and paragraphs [0020], [0023], [0070], [0090] and [0092]). However, none of the cited passages mentions anything about migrating data to different storage classes *in response to the application of access information to the set of policies*. The Examiner refers to Yakir's teachings regarding migrating a stub file from one storage unit to another, but fails to cite any portion of Yakir that discloses migrating a stub file **in response to the application of access information to a set of policies**. Instead, Yakir teaches that a stub file is migrated in response to an originating server receiving a signal to move a stub file and that “[t]he signal may be received from a user, an application or program, or from other like source” (Yakir, paragraph [0063]). Thus, Yakir discloses migrating a stub file in response to a signal from a user, application or a similar source. A signal from a user or an application cannot be considered an application of access information to a set of policies. Yakir clearly does not describe migrating data in response to the application of access information to a set of policies.

Applicants remind the Examiner that anticipation requires the presence in a single prior art reference disclosure of each and every limitation of the claimed invention, arranged as in the claim. M.P.E.P 2131; *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984). The identical invention must be shown in as complete detail as is contained in the claims. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). As discussed above, Yakir fails to disclose a multi-class storage mechanism configured to monitor access of data stored in a multi-class file system comprising a hierarchy of storage classes to generate access information for the data, wherein each storage class comprises one or more storage devices assigned to the storage class according to one or more characteristics of the storage class. Yakir further fails to disclose that the multi-class storage mechanism is configured to apply the access information to a set of policies for the multi-class file system and to migrate a portion of the data to different storage classes in the hierarchy of storage classes in

response to the application of access information to the set of policies for the multi-class file system. Therefore, Yakir cannot be said to anticipate claim 1.

For at least the reasons above, the rejection of claim 1 is not supported by the cited art and removal thereof is respectfully requested. Similar remarks apply to claims 14, 16 and 30.

Regarding claim 15, Yakir fails to disclose a system including means for means for implementing a multi-class file system including a hierarchy of storage classes on a plurality of storage devices, where each storage class includes one or more of the storage devices assigned to the storage class according to one or more characteristics of the storage class. Please refer to the remarks above regarding claim 1, for a detailed discussion of Yakir's failure to disclose a multi-class file system including a hierarchy of storage classes on a plurality of storage devices, where each storage class includes one or more of the storage devices assigned to the storage class according to one or more characteristics of the storage class.

Yakir further fails to disclose software means for assigning a migrating data to different storage classes in the hierarchy of storage classes according to a set of policies for the multi-class file system. The Examiner does not cite any portion of Yakir that describes migrating data to different storage classes in a hierarchy of storage classes. Yakir only mentions that data may be migrated from an original storage location on an original volume to a repository storage location on a repository volume and that a stub file may also be migrated from an original storage location to another storage location. However, Yakir does not mention migrating data to *different storage classes in a hierarchy of storage classes*. In fact, Yakir makes not mention of different storage classes at all. The Examiner equates the mere fact that Yakir's system includes multiple physical storage devices and multiple logical storage units as including a hierarchy of storage classes. However, merely providing multiple physical storage devices and multiple logical storage units does not disclose anything regarding *different storage classes* or about a *hierarchy of storage classes*.

Nor does having multiple physical/ logical storage units disclose anything about migrating data according to a set of policies for a multi-class file system. Yakir merely describes the existence of storage policies and rules (Yakir, paragraph [0023]), but fails to disclose migrating data to different storage classes according to a set of policies. As noted above regarding claim 1, Yakir described migrating a stub file in response to receiving a signal from a user, application, program, or other like sources. Nowhere does Yakir mention anything regarding migrating data according to a set of policies.

Thus, the rejection of claim 15 is not supported by the cited art and removal thereof is respectfully requested.

Regarding claim 2, Yakir fails to disclose file system software that includes file system functionality configured to implement the hierarchy of storage classes of the multi-class file system. The Examiner cites paragraphs [0020], [0070], [0090] and [0092] of Yakir and asserting that in Yakir's system, “[p]hysical storage units 102 may be organized into one or more logical storage units/devices 104” and that a “logical storage unit may reside on non-[contiguous] physical partitions.” However, as noted above regarding the rejection of claim 1, merely having multiple physical and logical storage units where a logical storage unit may reside on non-contiguous physical partitions does not disclose or imply a hierarchy of storage classes. Thus, Yakir fails to disclose a hierarchy of storage classes. Additionally, Yakir fails to disclose file system functionality configured to implement the hierarchy of storage classes. Yakir only teaches that data may be migrated from an original storage location to another storage location but makes no mention of any file system functionality configured to implement a hierarchy of storage classes. Thus, the rejection of claim 2 is not supported by the cited art and removal thereof is respectfully requested. Similar remarks also apply to claim 18.

Regarding claim 7, Yakir fails to disclose where the multi-class storage mechanism is configured to modify file system metadata for the migrated data to indicate the different storage classes for the migrated data. The Examiner cites paragraphs [0049-

0053] of Yakir. This portion of Yakir describes that data, metadata and stub files may be migrated but does not mention anything regarding modifying metadata to indicate different storage classes for migrated data. Yakir does not disclose any kind of indication of different storage classes for migrated data, either in metadata or elsewhere. Merely describing that data, metadata and stub files can be migrated does not disclose the specific limitation of modifying file system metadata to indicate different storage classes for the migrated data. Thus, the rejection of claim 7 is not supported by the cited art and removal thereof is respectfully requested. Similar remarks also apply to claims 23 and 35.

Regarding claim 11, Yakir fails to disclose file system software that is configured to add a new storage class to the hierarchy of storage classes. The Examiner cites paragraph [0006] of the background section of Yakir and refers to Yakir's teaching regarding reorganizing data when deploying new servers. However, the cited passage of Yakir does not describe anything about adding a new storage class to a hierarchy of storage classes. Instead, the cited passage describes how stub files may be moved from one storage location to another for various reasons, including reorganizing data when deploying new servers and storage devices. No mention is made about *adding a new storage class* to a hierarchy of storage classes. In fact, nowhere does Yakir mention file system software configured to add a new storage class to the hierarchy of storage classes. Thus, the rejection of claim 11 is not supported by the cited art and removal thereof is respectfully requested. Similar remarks also apply to claims 27 and 39.

Section 103(a) Rejections:

The Examiner rejected claims 3-5, 12, 19-21, 29, 31-33 and 41 under 35 U.S.C. § 103(a) as being unpatentable over Yakir in view of Leung et al. (U.S. Publication 2004/0039891) (hereinafter "Leung") and claims 5, 21 and 33 as being unpatentable over Yakir in view of Gill (U.S. Patent 6,947,959). Applicants respectfully traverse the

rejections of these claims for at least the reasons presented above regarding their respective independent claims.

Further regarding claim 3, Yakir in view of Leung does not teach or suggest storage classes that are ordered in a hierarchy of storage classes according to performance characteristics from a highest storage class comprising high-performance storage devices to a lowest storage class comprising low-performance storage devices. The Examiner admits that Yakir does not teach storage classes ordered in a hierarchy according to performance characteristics but relies upon Leung, citing paragraphs [0037-0038] and [0053-0054]. However, none of the cited paragraphs mentions storage classes ordered in a hierarchy of storage classes *according to performance characteristics*. Instead, the cited paragraphs describe storage units may be classified into groups according to the data storage cost, such as a monetary value of storage data per unit of storage. Yakir also describes using other criteria, such as volume capacity, manufacturer, or device type, to group storage units. However, Leung fails to mention anything regarding storage classes ordered according to performance characteristics.

Yakir and Leung, whether considered singly or in combination, fail to teach or suggest storage classes that are ordered in a hierarchy of storage classes according to performance characteristics from a highest storage class comprising high-performance storage devices to a lowest storage class comprising low-performance storage devices. Thus, for at least the reasons above, the rejection of claim 3 is not supported by the cited art and removal thereof is respectfully requested. Similar remarks also apply to claims 19 and 31.

Regarding the section § 102 and § 103 rejections, Applicant also asserts that numerous other ones of the dependent claims recite further distinctions over the cited art. However, since the rejections have been shown to be unsupported for the independent claims, a further discussion of the dependent claims is not necessary at this time.

CONCLUSION

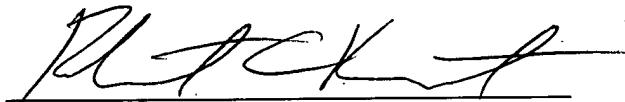
Applicants submit the application is in condition for allowance, and notice to that effect is respectfully requested.

If any extension of time (under 37 C.F.R. § 1.136) is necessary to prevent the above-referenced application from becoming abandoned, Applicants hereby petition for such an extension. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5760-14900/RCK.

Also enclosed herewith are the following items:

- Return Receipt Postcard
- Petition for Extension of Time
- Notice of Change of Address
- Other:

Respectfully submitted,



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